

NATIONAL COMMISSION ON AGRICULTURE 1976

RAINFALL AND CROPPING PATTERNS

Volume VII

JAMMU & KASHMIR



सत्यमेव जयते



सत्यमेव जयते

GOVERNMENT OF INDIA
MINISTRY OF AGRICULTURE AND IRRIGATION
NEW DELHI

**NATIONAL COMMISSION ON AGRICULTURE
1976**

RAINFALL AND CROPPING PATTERNS

Volume VII

JAMMU & KASHMIR



सत्यमेव जयते



सत्यमेव जयते

**GOVERNMENT OF INDIA
MINISTRY OF AGRICULTURE AND IRRIGATION
NEW DELHI**

RAINFALL AND CROPPING PATTERNS—STATE SERIES

| VOLUME NO | STATE |
|-----------|------------------|
| I | ANDHRA PRADESH |
| II | ASSAM |
| III | BIHAR |
| IV | GUJARAT |
| V | HARYANA |
| VI | HIMACHAL PRADESH |
| VII | JAMMU & KASHMIR |
| VIII | KERALA |
| IX | MADHYA PRADESH |
| X | MAHARASHTRA |
| XI | ORISSA |
| XII | PUNJAB |
| XIII | RAJASTHAN |
| XIV | TAMIL NADU |
| XV | UTTAR PRADESH |
| XVI | WEST BENGAL |



CONTENTS

| | PAGE |
|----------------------------------------------------------------------------|------|
| 1 INTRODUCTION | 1 |
| 2 METHODOLOGY | 1 |
| Rainfall Patterns | 1 |
| Boundaries of Rainfall Zones | 2 |
| Cropping Patterns | 3 |
| Relative Yield Index of Crops | 3 |
| Livestock Patterns | 3 |
| Soils | 4 |
| Other Data | 4 |
| Presentation of Information | 4 |
| 3 GENERAL FEATURES | 4 |
| Elevation | 4 |
| Population | 4 |
| Land Use | 5 |
| Soils | 5 |
| Rainfall | 5 |
| Variability | 6 |
| Temperature | 6 |
| Potential Evapotranspiration (PE) | 7 |
| 4 RAINFALL ZONES, THEIR CROPPING PATTERNS AND LIVESTOCK PATTERNS | 8 |
| Rainfall Zone I | 8 |
| Rainfall Zone II | 8 |
| Rainfall Zone III | 8 |
| Rainfall Zone IV | 8 |
| Rainfall Zone V | 9 |
| Rainfall Zone VI | 9 |
| Rainfall Zone VII | 9 |
| Rainfall Zone VIII | 9 |
| Rainfall Zone IX | 10 |
| Rainfall Zone X | 10 |
| Rainfall Zone XI | 10 |
| Rainfall Zone XII | 10 |
| Relative Yield Index | 10 |
| 5 FUTURE CROPPING PATTERNS—SOME OBSERVATIONS | 11 |
| General | 11 |
| Some Observations Pertaining to Jammu & Kashmir | 11 |

APPENDIX**PAGE**

| | |
|------------------------------------------------------------------------------------|----|
| 1 Talukwise Land Use (1969-70) and Population Statistics—Jammu & Kashmir | 12 |
| 2 Talukwise Livestock Population —1966—Jammu & Kashmir | 15 |
| 3 Rainfall and Cropping Patterns—Jammu & Kashmir | 18 |
| 4 Area under Principal Crops (1969-70)—Jammu & Kashmir | 20 |
| 5 Map—Rainfall Patterns | 23 |
| 6 Map—Cropping Patterns | 25 |
| 7 Map—Livestock Patterns | 27 |



सत्यमेव जयते

RAINFALL AND CROPPING PATTERNS

JAMMU AND KASHMIR

INTRODUCTION

1.1 The human population of the country is estimated to rise from the 1971 Census figure of 548 million to 935 million in 2000 AD. This rise calls for increased production. Land resources being limited emphasis has to be placed on increasing productivity per unit area. Temperature and other climatic conditions being favourable for crop production throughout the year over most parts of the country, it is possible to grow more than one crop in a year provided water, the most important input, is available. In some parts of the country the rainy season is long enough to provide scope for double cropping. This potential is yet to be fully exploited. There is scope for increasing irrigation resources in the country, but our estimates show that the area under irrigation is not expected to be more than 42 per cent of the total cropped area even in 2000 AD as against 22 per cent in 1970-71. Therefore, judicious utilisation of direct rainfall and irrigation water, singly and in combination, will have to be thought of for increasing production.

1.2 Farming technology has so advanced that it is possible to increase crop yields even under rainfed conditions, but the choice of crops would have to depend upon the amount and distribution of the prevailing rainfall. Additionally, it will be necessary that the maximum possible quantity of rain water is conserved in ponds and pools situated either within the farm area or elsewhere, in soil profiles and underground storages so that the same could be readily used to save crops in times of water stress. Not only in rainfed farming but even under irrigated conditions, one will have to plan for the most economic and efficient use of water so as to derive maximum possible benefit from rainfall and reduce dependence

on irrigation. This necessitates a close study of the existing cropping patterns vis-a-vis rainfall patterns aimed at determining the nature of changes needed in the former. The cropping patterns depend primarily on the soil and climatic factors but the evolution of a cropping pattern in course of time is the combined effect of soil, climate, food habits and requirements and economic factors. In the context of increasing production, it is necessary to examine the cropping patterns from a scientific angle and find out possible alternative patterns having higher potential. Accordingly, the Commission undertook a comprehensive study of the rainfall and cropping patterns of the country using taluk or tehsil as unit of area. It covered several other relevant factors such as orography, land use data, human and livestock populations, soil and climate, the object being to make, as far as possible, an integrated assessment.

1.3 Chapter 14 on Rainfall and Cropping Patterns of the Commission's Report presents a consolidated account of the data collected together with analysis of their inter-relationships on all-India basis. In this analysis the Commission has been greatly benefited by the discussions with the concerned officers of State Governments. It was realised that by condensing the vast amount of information collected from each State into the small space of a chapter, many important and peculiar features of individual States were likely to be missed and hence the data and analysis of each State have been presented in separate volumes. The manner of presentation is similar to Chapter 14. It has also been considered desirable to include in each State volume the methodology and suggestions for future cropping patterns, which are practically the same as given in Chapter 14.

2 METHODOLOGY

2.1 The chief features of the study are (a) use of taluk or tehsil as unit of area for all basic data and analysis; (b) introduction of coded numerical forms to express patterns of distribution of monthly rainfall throughout the year, crops and livestock; (c) inclusion of information on orography, temperature, evapotranspiration, rainfall, soil, irrigation, land use, human and livestock populations and yield performance of crops, all of which influence in different ways and degrees the cropping patterns of a place and (d) presentation of coded information on rainfall, crops and livestock on 1 : 1 million scale maps.

Rainfall Patterns

2.2 A major feature of Indian rainfall is that the southwest monsoon season (June to September) accounts for 70 to 95 per cent of the annual rainfall throughout the country except in the south east peninsula and Kashmir and adjoining hill areas. The monsoon as well as the annual rainfall show large fluctuations from year to year but, as stated in Chapter 13 on Climate and Agriculture, there is no significant evidence of any trend of periodicity in either of them. Considered in relation to crop production,

the total annual or seasonal rainfall does not have much significance and what is important is its distribution during the period of growth of different crops. A relevant question, therefore, is whether rainfall should be examined on a weekly, fortnightly or monthly basis. The coefficient of variation (CV) of monthly rainfall is as high as 40-50 per cent even in the rainiest month of July over most of the central, northern and eastern India. In the south excluding the west coast, CV is higher and varies from 60 to 100 per cent. The variability of weekly or fortnightly rainfall being still greater, makes the use of either of them undependable as indicators of rainfall distribution. For a macro-study like the present, monthly rainfall data which are more dependable and also the most convenient to handle have been used.

2.3 In order to relate crop production with rainfall, certain norms have to be assumed depending on the duration of the crops and their water requirements. On the basis of available information and the fact that most crops mature in about 90 days, the following broad norms have been drawn up :

- (i) Rainfall greater than 30 cm per month (cm pm) for at least three consecutive months would be suitable for a crop like paddy whose water need is very high.
- (ii) 20-30 cm pm for not less than three consecutive months would be suitable for crops whose water need is high but less than that of paddy, for example, maize and black gram.
- (iii) 10-20 cm pm for at least three consecutive months would be suitable for crops requiring much less water, e.g., bajra and small millets.
- (iv) 5-10 cm pm for three consecutive months would be just sufficient for crops which have low water requirements, e.g., moth (*P. aconitifolius*) and ephemeral grasses.
- (v) Rainfall less than 5 cm pm for three consecutive months is not of much significance for crop production.

2.4 For denoting the year's rainfall distribution using monthly totals, a convenient code in letter symbols with numerical subscripts explained below, has been evolved. The letters A to E in Table 1 indicate the ranges of monthly rainfall and the subscripts to these refer to the number of months having these ranges of rainfall e.g. A_2 indicates two months with rainfall greater than 30 cm pm. The ranges correspond to those stated in the preceding paragraph.

TABLE 1
Code for Rainfall Data

| Symbol | Monthly rainfall cm pm |
|--------|---------------------------|
| A+ | Greater than 30 |
| B | 20—30 |
| C | 10—20 |
| D* | 5—10 |
| E* | Less than 5 |

+ An examination of monthly rainfall in the country shows that except for areas in the west coast and some hill stations in extrem north-east, normal monthly rainfall seldom exceeds 40 cm.

* In distributions containing ranges of rainfall covered by A or B termed briefly as A & B types amounts less than 10 cm are not so significant and their frequency is generally small. To reduce the number of combination, D is omitted in A or B type distributions; instead E is used to denote less than 10 cm pm. Thus $B_2 E_2$ would denote two months of 20-30 cm pm and two months less than 10 cm pm rainfall.

The southwest monsoon months of June to September being the principal rainy season dominate the rainfall distributions of the country. To indicate the season's importance, monthly rainfall distribution during June to September is shown in brackets in the annual pattern. To the right of the bracket is the distribution for the post-monsoon months, namely, October to January and to the left that for the pre-monsoon months namely, February to May. In order to explain how such a coded rainfall distribution written in symbols with numerical subscripts has to be interpreted, a hypothetical example may be considered. $D_1 E_3 (A_2 B_1 C_1) C_1 D_3$, in which for each of the three periods, the symbols are in order of decreasing rainfall which is not necessarily the calendar sequence, can be explained as under :

- (i) $D_1 E_3$ represents the period February to May in which one month's rainfall (usually May) is in the range of 5-10 cm and the remaining three months get less than 5 cm pm.
- (ii) $A_2 B_1 C_1$ represents the period June to September, in which two months (usually July and August) get more than 30 cm pm rainfall, one month (September) gets 20-30 cm and the remaining month, i.e. June gets 10-20 cm.
- (iii) $C_1 D_3$ represents the period October to January in which October gets 10-20 cm rainfall and the rest 5-10 cm pm.

Boundaries of Rainfall Zones

2.5 Since differences in monthly, seasonal and annual rainfall are not large within short distances, linear interpolation of rainfall data is permissible. Rainfall data being point measurements, isolines for the same or nearly the same type of distribution of monthly rainfall can, therefore, be drawn. These isolines may not necessarily follow the boundaries of taluks which are taken to be unit of area in this study

and hence for delineation of boundaries the following procedure has been adopted :

- (i) Where variations are small, isolines follow the taluk boundaries;
- (ii) where variations are large, isolines delineate the zone boundaries; and
- (iii) any taluk, more than three quarters of which lies outside of a zone is not considered a part of that zone.

2.6 If an identical distribution is observed over two or more adjacent taluks a pattern is said to have evolved and the area covered by it is distinguished as a zone and indicated suitably by a Roman numeral. Rainfall patterns have been identified for the whole country using the methodology described above. The data used for the analysis are the monthly normals of rainfall (1901 to 1950)¹ and the patterns and zones are depicted on all-India map which forms part of Chapter 14 on Rainfall and Cropping Patterns of the Commission's Report.

Cropping Patterns

2.7 The basic data for the study of cropping patterns of the country are the areas under different crops in each of the taluks. A large number of crops are grown in a taluk but most of them occupy small areas, often less than one per cent of the total cropped areas of the taluk. With a view to limiting the number of crops constituting a pattern only those crops are considered which individually occupy 10 per cent or more of the gross cropped area of the taluk. In this process, several crops have to be excluded, even though they may be otherwise important. The minimum limit has been fixed at 70 per cent, so that the number of crops, which together cover at least 70 per cent of the gross cropped area, and in which none occupies less than 10 per cent, is not large. Trial computations have shown that in such distributions any crop occupying more than 10 per cent area is rarely omitted and the number of crops hardly exceeds five. When the same distribution holds good for two or more adjacent taluks, a pattern is obtained.

2.8 As in the case of rainfall, percentage area coverage by crops is expressed by means of numerical subscripts affixed to crop symbols shown in Table 2. The list of crops given below is comprehensive and will hold good for all the States.

TABLE 2
Crop Symbols and Area Intervals

| Crop | Symbol |
|------------------|-----------------|
| 1 rice | pd ¹ |
| 2 wheat | w |
| 3 jowar (kharif) | Jk |
| 4 jowar (rabi) | Jr |
| 5 bajra | B |
| 6 maize | M |
| 7 ragi | R |
| 8 small millets | Mt |
| 9 barley | Ba |

TABLE 2 (Contd.)

| Crop | Symbol |
|-----------------------------------------|--------|
| 10 oats | Oa |
| 11 gram | G |
| 12 pigeonpea(tur) | T |
| 13 pulses other than pigeonpea and gram | Pu |
| 14 groundnut | Gn |
| 15 oilseeds other than groundnut | O |
| 16 cotton | C |
| 17 jute | Ju |
| 18 other fibres | Fb |
| 19 sugarcane | S |
| 20 potato | Pt |
| 21 vegetables | V |
| 22 fruits | Fr |
| 23 tapioca | Ta |
| 24 plantations | L |
| 25 fodder | F |
| 26 chillies | Ch |
| 27 tobacco | To |

Area interval
(per cent)

Subscript

| | |
|--------------|---|
| 70 or more | 1 |
| 50—70 | 2 |
| 30—50 | 3 |
| 10—30 | 4 |
| less than 10 | 5 |

The crop code contains the crop symbol and the appropriate subscript. In writing crop distribution, the first crop has always the highest area but the rest may not necessarily follow the order of decreasing areas. For example, crop distribution, C₃ J₁₄ M₄ means that cotton area is 30-50 per cent and jowar rabi and millets each occupies 10.30 per cent of the gross cropped area, the total being 70 per cent or more. Two or more taluks having the same distribution of crops constitute a pattern. Cropping patterns so derived have been indicated on maps of 1 : 1 million size.

Relative Yield Index of Crops

2.9 Besides the absolute figures the yield of a crop has also been expressed as per cent of all-India average which is called Relative Yield Index (RYI). Relative Yield Index values have been computed for the principal crops on the basis of (1968-69 to 1970-71) data available in the records of the Directorate of Economics and Statistics, Ministry of Agriculture and Irrigation.

Livestock Patterns

2.10 The livestock patterns are relevant only insofar as these are related to production of fodder and feeds. As talukwise data were not available for the livestock Census, 1972, those of 1966 Census as published by the States have been used. The animals considered for livestock analysis are shown in Table 3 together with their symbols.

TABLE 3
Livestock Symbols

| Category | Symbol |
|--------------------------------|--------|
| cattle : | |
| male (over 3 years) | Cm |
| female (over 3 years) | Cf |
| young stock (under 3 years) | Cy |
| buffaloes : | |
| male (over 3 years) | Bm |
| female (over 3 years) | Bf |
| young stock (under 3 years) | By |
| sheep | S |
| goats | G |
| horses, mules and ponies | H |
| donkeys | D |
| camels | Ca |
| pigs | P |

The livestock patterns are expressed in coded form in the same manner as the cropping patterns.

Soils

2.11 Soil data on a taluk basis are not available for all the areas of the country. As such, soils have been discussed in a general manner using the traditional nomenclature in describing their characteristics.

3 GENERAL FEATURES

3.1 The geographical area of Jammu & Kashmir State according to 1971 Census is 222, 236 sq. km. This includes areas under illegal occupation of China and Pakistan. The State consists of ten districts and fortyfour tehsils. Jammu region consists of Doda, Udhampur, Jammu, Kathua, Rajouri and Punch districts and Kashmir region includes Anantnag, Ladakh, Baramulla and Srinagar districts. The total reporting area of the State according to the village papers is 45,230 sq. km. This excludes areas under illegal occupation of China and Pakistan as also certain non-reporting areas in the State.

Elevation

3.2 The elevations in the southern tehsils of Jammu and Kathua districts are 300 to 500 masl (metres above sea level). In Reasi and Rajauri districts, the elevations range from 600-800 masl, while in the northern districts they are mostly of the order of 1600 masl rising in places to 3000 masl. In Leh, the elevation is 3500 masl.

Other Data

2.12 The sources of other data featuring in the study are given below :

| item | source |
|--------------------------------------|------------------------------------------------------------------------------------------------------------|
| taluk area . | States' Census Reports 1971 or from the data furnished by the States in their land-use returns. |
| orography | maps of the Survey of India and National Atlas Organisation. |
| temperature | Climatological Tables of Observatories in India, India Meteorological Department, 1931—1960 normals |
| evapotranspiration | scientific Report No. 136 of the India Meteorological Department, 1971. |
| human population | Census of India, 1971 |
| irrigation and land use statistics . | basic data pertaining to land utilisations statistics obtained from the States and refer mostly to 1969-70 |

Presentation of Information

2.13 The tables required for following the text are given in the text itself at appropriate places, whereas the basic data are appended as follows :

| | |
|------------|-------------------------------------------------------------------------------------------------------|
| APPENDIX 1 | Talukwise Land Use (1969-70) and Population Statistics, (arranged according to State rainfall zones). |
| APPENDIX 2 | Talukwise Livestock Population—1966 (arranged according to State rainfall zones). |
| APPENDIX 3 | Zonewise Information on Rainfall, Rainy days and Cropping Patterns. |
| APPENDIX 4 | Zonewise Area under Principal Crops. |

2.14 Rainfall, cropping and livestock patterns of each State are indicated on maps in the 1 : 1 million scale and given in Appendices 5, 6 and 7 respectively. In the case of rainfall patterns, the zonal numbers in State maps have been given in Roman numerals and their all-India equivalents as used in Chapter 14 of the Commission's Report have been shown in three digit Arabic numerals within brackets.

Population

3.3 The total population of the State is 46.2 million with an average population density of 34 per sq. km. The population density varies very considerably from 1 in Ladakh to 275 in Srinagar district. Population density in various districts of the State is given in Table 4.

TABLE 4
Density of Population (per sq km)

| District | Density |
|-----------|---------|
| Anantnag | 155 |
| Srinagar | 275 |
| Baramulla | 104 |
| Ladakh | 1 |
| Doda | 29 |
| Udampur | 74 |
| Jammu | 231 |
| Kathua | 104 |
| Rajauri | 81 |
| Punch | 103 |

Land use

3.4 Forests occupy substantial areas in the State being 2,778,000 ha. Proportion of area under forests to total reporting area is high, in Udhampur, Doda and Rajauri districts, being 40 to 50 per cent, whereas it is quite low in Kashmir region. However, it does not represent the true picture of Kashmir region since information regarding a considerable proportion of total geographical area is not available. Land not available for cultivation is 20 to 30 per cent in the districts of Jammu region except in Doda where it is 16 per cent only. In Kashmir region it is 17 to 19 per cent except for Leh where it is 50 per cent. Fallow lands are less than 5 per cent except for 14 per

cent (average) in Jammu district. The net sown area in the southern districts of Doda, Udhampur, Rajauri and Punch is 10-20 per cent and Jammu nearly 30 per cent though in Ranbir Singh Tehsil it is as high as 70 per cent. In the northern districts of Kashmir region it is around 60 per cent. In Handwara, Sopore and Baramula tehsils net sown area is as high as 75 per cent of the reported area. In Leh it is only 23 per cent. Table 5 shows the land use pattern in different districts based on village papers. Area sown more than once varies from less than 10 per cent of the net sown area in half the number of tehsils to over 80 per cent in two tehsils of Jammu. Of the 8 tehsils with cropping intensity of over 150 per cent, four are in Jammu district which has an average of 162 per cent.

TABLE 5
Land Use Statistics—1969-70

| District | Forests | Not available for cultivation | Cultivable waste | Permanent pastures & other grazing lands | Land under misc. tree crops & groves | Fallow lands | (Per cent of total reporting area) | |
|----------|---------|-------------------------------|------------------|------------------------------------------|--------------------------------------|--------------|------------------------------------|--------------------------------------------------------|
| | | | | | | | Net area sown | Area sown more than once as per cent of net sown area. |
| Srinagar | 1.6 | 19.1 | 5.3 | 7.7 | 2.1 | 1.6 | 62.7 | 3.2 |
| Anantnag | 0.5 | 17.7 | 6.7 | 8.6 | 1.7 | 5.0 | 59.7 | 14.7 |
| Baramula | 0.8 | 17.0 | 7.2 | 8.9 | 0.7 | 4.5 | 61.0 | 1.6 |
| Ladakh | 0.1 | 50.5 | 15.3 | 1.6 | 2.0 | 1.2 | 29.3 | 6.3 |
| Jammu | 14.7 | 26.0 | 12.6 | 3.5 | 0.9 | 14.3 | 28.0 | 82.8 |
| Kathua | 26.3 | 29.5 | 3.8 | 4.2 | 8.7 | 3.5 | 23.8 | 37.4 |
| Doda | 53.2 | 16.0 | 4.7 | 1.9 | 8.9 | 2.5 | 12.8 | 13.5 |
| Udhampur | 45.3 | 22.3 | 5.4 | 4.7 | 7.0 | 2.2 | 13.1 | 43.0 |
| Rajauri | 41.3 | 24.3 | 7.7 | 6.9 | 0.5 | 2.7 | 16.6 | 50.0 |
| Punch | 27.6 | 24.9 | 6.2 | 14.4 | 3.2 | 3.4 | 20.8 | 24.7 |

NOTE : The percentage figures have been rounded off individually and hence cross totals may not in some cases, add up to 100.

Soils

3.5 Red and yellow soils cover the southern half of Kathua, northern half of Jammu and southern half of Reasi while southern half of Jammu has recent alluvial soils. Mostly sub-montane soils prevail in the rest of the State except in Ladakh, which has mountain and meadow soils.

3.6 The net irrigated area in 1967-68 was 279,00 ha, 97 per cent of which was irrigated by canals. There is wide variation in net irrigated area in districts being 68 per cent of net sown area in Srinagar and only 10-13 per cent in Udhampur, Rajauri and Punch. Twelve tehsils in the northern districts of Srinagar, Anantnag and Baramula and one tehsil of Ranbirsinghpore in Jammu have more than 50 per cent area under irrigation. Net area irrigated in southern tehsils is generally less than 20 per cent.

Rainfall

3.7 Rainfall data for the northern areas and Ladakh are scanty. Therefore, the observations relating to

these areas are only indicative and approximate. The average annual rainfall in the State varies considerably from less than 10 cm in Leh (Ladakh district) and its neighbourhood to about 200 cm in Gulabgarh (Udhampur district). The belt from Basohli in Kathua district to Punch district has annual average rainfall of 150 to 200 cm. The district annual average rainfall excepting Srinagar and Ladakh exceeds 100 cm. In southern areas the month of maximum rainfall is August, while in the north and Ladakh maximum rainfall occurs in March. In southern areas rainfall in July and August is of the same order and total for both the months is 50-60 per cent of the annual precipitation. June to September period receives 65 to 75 per cent of annual rainfall. In northern areas, January to April period gets about 50 per cent of annual rainfall. In Doda district, the months January to April receive heaviest rainfall. Rainfall in July and August is slightly less but of the same order. Districtwise monthly and annual rainfall and monthly rainfall as per cent of annual are given in Table 6.

TABLE 6
Districtwise Monthly and Annual Rainfall
JAMMU AND KASHMIR

| District | rainfall (mm) | | | | | | | | | | | | Annual |
|-------------|-----------------|-----------------|-----------------|-----------------|----------------|---------------|-----------------|-----------------|-----------------|---------------|---------------|---------------|--------|
| | Jan | Feb | March | April | May | June | July | Aug. | Sept | Oct | Nov | Dec. | |
| 1. Anantnag | 136.3 (13.0) | 139.3 (13.3) | 156.2 (14.9) | 128.0 (12.2) | 83.0 (7.9) | 48.7 (4.7) | 76.2 (7.3) | 78.8 (7.5) | 62.9 (6.0) | 35.1 (3.4) | 24.4 (2.3) | 76.3 (7.3) | 1045.2 |
| 2. Srinagar | 61.0 (9.7) | 71.6 (11.4) | 80.7 (12.8) | 83.9 (13.3) | 64.4 (10.2) | 30.5 (4.8) | 57.6 (9.2) | 68.5 (10.9) | 41.0 (6.5) | 25.1 (4.0) | 11.7 (1.9) | 33.1 (5.3) | 629.1 |
| 3. Baramula | 127.3 (12.4) | 130.2 (12.8) | 168.9 (16.6) | 133.1 (13.0) | 85.2 (8.3) | 56.9 (5.6) | 65.6 (6.4) | 67.1 (6.6) | 47.1 (4.6) | 46.8 (4.6) | 23.3 (2.3) | 69.0 (6.8) | 1020.5 |
| 4. Ladakh | 43.4 (14.6) | 42.8 (14.4) | 60.6 (20.4) | 43.6 (14.7) | 26.7 (9.0) | 8.5 (2.9) | 10.6 (3.6) | 13.0 (4.4) | 11.2 (3.8) | 7.9 (2.7) | 5.7 (1.9) | 23.4 (7.9) | 297.4 |
| 5. Doda | 147.6 (13.7) | 144.8 (13.5) | 149.0 (13.9) | 97.2 (9.0) | 58.5 (5.4) | 48.7 (4.5) | 118.9 (11.1) | 110.9 (10.3) | 62.9 (5.9) | 32.6 (3.0) | 21.3 (2.0) | 82.1 (7.6) | 1074.5 |
| 6. Udhampur | 129.5 (7.7) | 122.4 (7.3) | 106.3 (6.3) | 63.1 (3.7) | 40.0 (2.4) | 92.8 (5.5) | 419.3 (24.8) | 452.8 (26.8) | 161.3 (9.6) | 25.6 (1.5) | 13.6 (0.8) | 61.5 (3.6) | 1688.2 |
| 7. Jammu | 63.0 (6.0) | 56.2 (5.3) | 54.9 (5.2) | 28.4 (2.7) | 22.0 (2.1) | 57.5 (5.4) | 300.3 (28.4) | 307.3 (29.1) | 115.3 (10.9) | 12.9 (1.2) | 6.4 (0.6) | 31.6 (3.0) | 1055.8 |
| 8. Kathua | 78.2 (6.1) | 71.0 (5.5) | 63.6 (4.9) | 30.1 (2.3) | 20.9 (1.6) | 62.8 (4.9) | 374.3 (29.0) | 390.3 (30.2) | 136.1 (10.5) | 18.2 (1.4) | 6.3 (0.5) | 39.7 (3.1) | 1291.8 |
| 9. Rajauri | 85.0 (7.0) | 87.4 (7.2) | 85.0 (7.0) | 56.3 (4.7) | 39.6 (3.3) | 81.8 (6.8) | 291.9 (24.1) | 290.0 (24.0) | 115.9 (9.6) | 22.9 (1.9) | 11.2 (0.9) | 42.8 (3.5) | 1209.8 |
| 10. Puncb | 127.0 (8.6) | 127.8 (8.7) | 138.9 (9.4) | 93.7 (6.4) | 67.6 (4.6) | 99.6 (6.8) | 300.5 (20.4) | 290.8 (19.7) | 116.8 (7.9) | 32.3 (2.2) | 16.8 (1.1) | 62.2 (4.2) | 1474.0 |

NOTE : Figures in paranthies denote the percentages of monthly rainfall to annual rainfall.

In southern areas, the months of heaviest rainfall are July and August each receiving 30 to 40 cm pm followed by September with 10 to 16 cm pm and June with 5 to 10 cm pm only. In northern areas, June to September months receive 5 to 10 cm pm rainfall. Rainfall in January to April period is generally between 10 and 15 cm pm excepting Srinagar and Ladakh where it is 5 to 10 cm pm and 4 to 6 cm pm respectively.

Variability

3.8 Coefficient of Variation (CV) for the months of January to May is of the order of 60 per cent in Srinagar and adjoining areas rising to 100 per cent close to the southern boundary. CV in June is 80 to 100 per cent. In the rainiest months of July and August in the south CV is 40 to 50 per cent. CV in the northern areas is much higher being 80 to 100 per cent or more. CV in the months of October to December is very high being more than 100 per cent. Seasonal CV for January—February combined is 50 to 60 per cent and for March to May 40 to 60 per

cent. The lower values of CV are in Srinagar area. CV in the months of June to September in south is 30 to 40 per cent and 40 to 50 per cent or higher in the northern areas. October to December CV is 80 to 100 per cent. CV of annual rainfall is only 20 to 25 per cent over most of the areas to the south and west of Srinagar. CV in Srinagar is 30 per cent and in Leh area 40 per cent. Coefficients of variation for the State as a whole are as follows :

Coefficient of Variation (CV%)

| | | | | | | | | | |
|-----|-----|--------|------------|----------|-----------|------|-----|------|-----|
| Jan | Feb | Mar | Apr | May | June | July | Aug | Sept | Oct |
| 57 | 59 | 50 | 48 | 53 | 56 | 33 | 82 | 82 | 100 |
| Nov | Dec | Annual | June-Sept. | Jan-Feb. | March-May | | | | |
| 139 | 75 | 16 | 26 | 38 | 28 | | | | |

Temperature

3.9 The normals of monthly maximum, minimum and mean daily temperatures are given in Tables 7 to 9.

TABLE 7
Normals of Daily Maximum Temperature (°C)

| Station | Jan | Feb | Mar | Apr | May | June | July | Aug | Sept | Oct | Nov | Dec | Annual |
|----------|------|------|------|------|------|------|------|------|------|------|------|------|--------|
| Dras | -9.0 | -6.7 | -2.0 | 5.4 | 15.1 | 20.5 | 23.7 | 23.6 | 19.6 | 12.8 | 4.3 | -4.0 | 8.6 |
| Kargil | -4.2 | -1.6 | 4.7 | 14.0 | 21.6 | 25.7 | 29.7 | 28.9 | 24.9 | 18.5 | 10.4 | 1.2 | 14.5 |
| Leh | -2.0 | 0.8 | 6.4 | 12.4 | 17.1 | 21.1 | 24.7 | 24.2 | 20.9 | 14.2 | 7.8 | 1.6 | 12.4 |
| Srinagar | 4.4 | 7.9 | 13.4 | 19.3 | 24.6 | 29.0 | 30.8 | 29.9 | 28.3 | 22.6 | 15.5 | 8.8 | 19.5 |
| Gulmarg | | | | | | 20.0 | 21.4 | 20.3 | 18.2 | | | | |
| Jammu | 18.4 | 21.1 | 26.4 | 33.1 | 39.0 | 40.4 | 35.4 | 33.2 | 33.3 | 31.4 | 26.2 | 21.1 | 29.9 |

TABLE 8

Normals of Daily Minimum Temperature (°C)

| Station | Jan | Feb | Mar | Apr | May | June | July | Aug | Sept | Oct | Nov | Dec | Annual |
|----------|-------|-------|-------|------|------|------|------|------|------|------|------|-------|--------|
| Dras | -22.2 | -21.4 | -15.0 | -5.2 | 1.5 | 5.6 | 10.6 | 10.5 | 5.9 | -1.1 | -8.6 | -16.9 | -4.6 |
| Kargil | -13.3 | -12.1 | -5.3 | 3.4 | 9.4 | 13.4 | 17.7 | 17.2 | 12.5 | 5.4 | -1.3 | -7.9 | 3.3 |
| Leh | -14.0 | -11.8 | -6.3 | -1.2 | 2.8 | 6.7 | 10.2 | 9.6 | 5.4 | -0.9 | -6.6 | -11.1 | -1.3 |
| Srinagar | -2.3 | -0.8 | 3.5 | 7.4 | 11.2 | 14.4 | 18.4 | 17.9 | 12.7 | 5.7 | -0.1 | -1.8 | 7.2 |
| Gulmarg | | | | | | 6.9 | 10.5 | 10.2 | 5.5 | | | | |
| Jammu | 8.3 | 10.6 | 14.8 | 20.5 | 25.8 | 27.7 | 26.0 | 25.1 | 23.9 | 19.4 | 13.4 | 9.3 | 18.7 |

TABLE 9

Normals of Daily Mean Temperature (°C)

| Station | Jan | Feb | Mar | Apr | May | June | July | Aug | Sept. | Oct. | Nov | Dec | Annual |
|----------|-------|-------|------|------|------|------|------|------|-------|------|------|-------|--------|
| Dras | -15.5 | -14.0 | -8.4 | 0.1 | 8.3 | 13.1 | 17.2 | 17.1 | 12.8 | 5.9 | -2.1 | -10.4 | 2.0 |
| Kargil | -8.7 | -6.9 | -0.3 | 8.7 | 15.5 | 19.5 | 23.7 | 23.1 | 18.7 | 11.9 | 4.5 | -3.3 | 8.9 |
| Leh | -8.3 | -5.4 | 0.1 | 5.6 | 10.0 | 13.9 | 17.5 | 16.9 | 13.2 | 6.7 | 0.6 | -4.7 | 5.5 |
| Srinagar | 1.1 | 3.6 | 8.5 | 13.4 | 17.9 | 21.7 | 24.6 | 23.9 | 20.5 | 14.2 | 7.7 | 3.5 | 13.4 |
| Gulmarg | | | | | | 13.5 | 15.9 | 15.3 | 11.9 | | | | |
| Jammu | 13.4 | 15.9 | 20.6 | 26.8 | 32.4 | 34.1 | 30.7 | 29.3 | 28.6 | 25.4 | 19.8 | 15.2 | 24.4 |

The hottest month is June in southern districts and July in northern ones with an average temperature of 40°C. Temperature in May and August is 1° either way of this value the difference being due to variation elevation. The maximum temperature in Srinagar is 30—31°C. The minimum temperature averages in the southern areas 8 to 11°C while in the northern areas, winter is very severe with temperatures much below the freezing point. Temperature in January and February are as low as—22°C in Dras, —14°C in Leh and —2°C in Srinagar. In the south, the hottest month is June having a temperature of 34°C. Temperatures in the months of July to September average 29 to 31°C. In north, July is the hottest month followed by August which has a slightly lower temperature of one degree. Due to differences in elevations, the temperatures in these months range between 15 to 25°C. Average of mean daily tempera-

ture in Srinagar is 24—25°C. During winter months of December to February, mean daily temperatures are 13 to 16°C in south and 10 to 15°C below zero in Dras. Average daily mean temperature in Srinagar in January is 1°C.

Potential Evapotranspiration (PE)

3.10 Monthly and annual values of PE for three northern stations Dras, Leh and Srinagar are given in Table 10. The annual PE ranges between 75 to 90 cm. PE in December and January is only 1-2 cm and 10 to 14 cm in the months May to August. In the southern areas, PE is much higher and similar to adjoining Punjab. The annual PE is about 140 cm. PE in June is 20 cm and 17 cm in July. In December and January PE is 3 to 4 cm.

TABLE 10

Normal Monthly and Annual Potential Evapotranspiration (PE)

| Station | Jan | Feb | Mar | April | May | June | July | Aug | Sep | Oct | Nov | Dec | Annual |
|----------|------|------|------|-------|-------|-------|-------|-------|------|------|------|------|--------|
| Dras | 9.2 | 13.7 | 32.4 | 55.7 | 97.4 | 125.3 | 138.0 | 128.2 | 93.8 | 51.6 | 19.4 | 9.6 | 775.0 |
| Leh | 16.1 | 25.4 | 50.3 | 78.7 | 105.7 | 119.2 | 123.0 | 106.4 | 81.1 | 82.1 | 27.4 | 17.5 | 803.4 |
| Srinagar | 18.4 | 28.0 | 53.8 | 80.7 | 111.2 | 130.9 | 135.8 | 117.6 | 95.0 | 57.8 | 26.5 | 17.7 | 874.0 |

4 RAINFALL ZONES, THEIR CROPPING PATTERNS AND LIVESTOCK PATTERNS

4.1 The State is divided into 12 Rainfall Zones. These are indicated below together with the number of taluks included in each and their total approximate areas.

| Rainfall Zone | Rainfall Pattern | Number of taluks with their total area in sq. km |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|
| I | E ₄ (E ₄) E ₄ | 3(572) |
| II | D ₁ E ₃ (B ₂ C ₁ E ₁) D ₁ E ₃ | 1(402) |
| III | D ₂ E ₂ (B ₂ E ₂) D ₁ E ₃ | 1(1127) |
| IV | D ₂ E ₂ (A ₂ C ₁ E ₁) D ₁ E ₃ | 7(5525) |
| V | D ₄ (D ₂ E ₂) D ₁ E ₃ | 10(2931) |
| VI | C ₁ D ₁ E ₂ (A ₂ C ₁ E ₁) C ₃ D ₁ E ₂ | 3(3256) |
| VII | C ₂ D ₁ E ₁ (A ₂ C ₁ E ₁) C ₁ D ₁ E ₂ | 3(2484) |
| VIII | C ₂ D ₂ (C ₂ D ₂) C ₁ D ₁ E ₂ | 3(2470) |
| IX | C ₂ D ₂ (B ₂ C ₁ E ₁) C ₁ D ₁ E ₂ | 2(1143) |
| X | C ₃ D ₁ (D ₁ E ₃) C ₁ D ₁ E ₂ | 5(1370) |
| XI | C ₃ D ₁ (D ₃ E ₁) C ₁ D ₁ E ₂ | 2(2158) |
| XII | C ₃ D ₁ (D ₄) C ₁ D ₁ E ₂ | 4(750) |

Rainfall Zone I—E₄ (E₄) E₄

4.2 The district, taluk and cropping patterns included in the zone are :

| Cropping pattern | Taluk | District |
|------------------------------------------------------------------|--------|----------|
| Mt ₃ W ₄ (W ₄ Pu ₄) | Leh | Ladakh |
| | Zaskar | " |
| | Kargil | " |

4.3 The area of the zone is 572 sq km and comprises of 3 taluks. The population density of the zone is 184 per sq km.

4.4 The gross cropped area is 18,000 ha, out of which 17,000 ha is net sown area. The net irrigated area is 16,000 ha. The area under small millets is 50 per cent of the cropped area followed by wheat (18 per cent).

4.5 Goats constitute 44 per cent of total livestock population followed by sheep (32 per cent). The two livestock patterns of the zone are :

S₃ G₄
G₃ S₄

Rainfall Zone II—D₁ E₃ (B₂ C₁ E₁) D₁ E₃

4.6 The taluk included in the zone is Ranbirsinghpura and the cropping pattern is Pd₃ W₃.

4.7 The area of the zone is 402 sq km and comprises only one taluk. It has a population density of 389 per sq km.

4.8 The gross cropped area is 54,000 ha, and paddy occupies 46 per cent of the cropped area followed by wheat 42 per cent.

4.9 The relative yield index value of rice in Jammu district is 85 per cent of all-India level.

4.10 Youngstock (cattle) constitute 24 per cent of livestock population, followed by female cattle (21 per cent), female buffaloes (19 per cent) and male cattle (12 per cent). The livestock pattern is Cy₄ Cf₄ Bf₄ Cm₄.

Rainfall Zone III—D₂ E₂ (B₂ E₂) D₁ E₃

4.11 The taluk included in this zone is Newsheera in Rajauri district and the cropping pattern is W₃ M₃.

4.12 The area of the zone is 1127 sq km and comprises only one taluk. The population density is 65 per sq km.

4.13 The sown area is 14,000 ha and the gross cropped area is 23,000 ha. The net irrigated area is 1,000 ha. Wheat occupies 48 per cent of cropped area, followed by Maize covering 40 per cent.

4.14 Livestock population comprises of goats (20 per cent), female cattle (18 per cent), and male cattle (17 per cent). The livestock pattern is G₄ Cf₄ Cm₄ Cy₄/Bf₄.

Rainfall Zone IV—D₂ E₂ (A₂ C₁ E₁) D₁ E₃

4.15 The districts, taluks and the cropping patterns in the zone are :

| Cropping pattern | Taluk | District |
|--------------------------------------------------------------------------------------------------|-----------|----------|
| W ₃ M ₄ Pd ₄ /B ₄ | Akhnoor | Jammu |
| | Jammu | " |
| | Samba | " |
| | Kathua | Kathua |
| | Hiranagar | " |
| Pd ₃ M ₄ W ₄ /O ₄ /V ₄ | Billawar | " |
| M ₃ W ₄ Ba ₄ /Pu ₄ /Mt ₄ /Pd ₄ | Bashohili | " |

4.16 The area of the zone is 5,525 sq km comprising of 7 taluks in 2 districts. The average population density is 154 per sq km.

4.17 The gross cropped area is 201,000 ha and about 22,000 ha is under irrigation. Wheat occupies 39 per cent of the gross cropped area, followed by paddy (17 per cent) and maize (14 per cent).

4.18 Goats constitute 23 per cent of the livestock population followed by youngstock (cattle) (17 per cent), female cattle (16 per cent) and male cattle (15 per cent). The livestock patterns of the zone are :

G₄ S₄ Cf₄ Cy₄
G₄ Cf₄ Cm₄ Bf₄

Rainfall Zone V—D₄ (D₂ E₂) D₁ E₃

4.19 The districts, taluks and the cropping patterns in the zone are :

| <i>Cropping pattern</i> | <i>Taluk</i> | <i>District</i> |
|-------------------------------------------------------------------------------|--------------|-----------------|
| Pd ₂ M ₄ | Anantnag | Anantnag |
| | Pulwama | " |
| | Shupian | " |
| | Tral | " |
| | Pahalgam | " |
| Pd ₃ M ₄ W ₄ /O ₄ /V ₄ | Srinagar | Srinagar |
| | Beerwah | " |
| | Gandarbal | " |
| | Chadura | " |
| | Badgam | " |

4.20 The area of the zone is 2,931 sq km and comprises of 10 taluks in two districts. The average population density is 497 per sq km.

4.21 The gross cropped area of the zone is 1,97,000 ha. Paddy occupies 45 per cent of the cropped area, followed by maize (22 per cent) and oilseeds other than groundnut (11 per cent).

4.22 Sheep constitute 45 per cent of the total livestock, followed by female cattle (19 per cent), youngstock (cattle) (16 per cent) and male cattle (14 per cent). The livestock pattern is S₃ Cf₄ Cm₄/Cy₄.

Rainfall Zone VI—C₁ D₁ E₂ (A₂ C₁ E₁) C₁ D₁ E₂

4.23 The district, taluks and the cropping patterns in the zone are :

| <i>Cropping pattern</i> | <i>Taluk</i> | <i>District</i> |
|--------------------------------------------------------------------------------------------------|--------------|-----------------|
| M ₃ W ₃ | Reasi | Udhampur |
| | Udhampur | " |
| M ₃ W ₄ Ba ₄ /Pu ₄ /Mt ₄ /Pd ₄ | Ramnagar | " |

4.24 The area of the zone is 3,256 sq km and comprises of 3 taluks. The average population density is 82 per sq km.

4.25 The gross cropped area is 70,000 ha, out of which maize occupies 41 per cent, wheat 31 per cent and paddy 13 per cent.

4.26 Goats account for 23 per cent of total livestock population, followed by sheep (18 per cent) and male cattle (14 per cent). The livestock pattern is G₄ S₄ Cm₄.

Rainfall Zone VII—C₂ D₁ E₁ (A₂ C₁ E₁) C₁ D₁ E₂

4.27 The districts, taluks and the cropping patterns in the zone are :

| <i>Cropping pattern</i> | <i>Taluk</i> | <i>District</i> |
|-------------------------------|-----------------|-----------------|
| M ₁ | Goal Gulab Garh | Udhampur |
| | Budhal | Rajauri |
| M ₂ W ₄ | Rajauri | " |

4.28 The area of the zone is 2484 sq km with an average population density of 88 per sq km.

4.29 The gross cropped area is 51,000 ha and net area sown is 40,000 ha. Maize occupies 64 per cent of the gross cropped area followed by wheat (22 per cent) and paddy (12 per cent).

4.30 Sheep constitute 25 per cent of the livestock population, with goats, female and youngstock cattle accounting for another 45 per cent. The livestock patterns are :

(i) S₄ G₄ Cf₄ Cy₄

(ii) G₄ Cf₄ Cm₄ Cy₄ Bf₄

Rainfall Zone VIII—C₂ D₂ (C₂ D₁) C₁ D₁ E₂

4.31 The district, taluks and the cropping patterns in the zone are :

| <i>Cropping pattern</i> | <i>Taluk</i> | <i>District</i> |
|--------------------------------------------------------------------------------------------------|--------------|-----------------|
| M ₁ | Ramban | Doda |
| | Doda | " |
| M ₃ W ₄ Ba ₄ /Pu ₄ /Mt ₄ /Pd ₄ | Bhadarwah | " |

4.32 The area of the zone is 2470 sq km and has an average population density of 99 per sq km.

4.33 As against a net sown area of 37,000 ha, the gross cropped area is 41,000 ha. An area of 4,000 ha is under irrigation. Maize occupies 61 per cent of the cropped area.

4.34 Sheep account for 30 per cent of the livestock population, followed by female cattle (19 per cent), male cattle (17 per cent) and youngstock cattle (14 per cent). The livestock patterns are :

(i) S₁ G₄ Cf₁ Cy₁

(ii) S₁ Cf₄ Cm₁ Cy₁

Rainfall Zone IX—C₂ D₂ (B₂ C₁ E₁) C₁ D₁ E₂

4.35 The district, taluks and the cropping pattern are as follows :

| <i>Cropping pattern</i> | <i>Taluk</i> | <i>District</i> |
|-------------------------|--------------|-----------------|
| M ₁ | Haveli | Punch |
| | Mendhar | .. |

4.36 The area of the zone is 1,143 sq km and the average population density is 149 per sq km.

4.37 The gross cropped area is 29,000 ha and the net shown area is 24,000 ha. Maize is the principal crop occupying 69 per cent of the cropped area and wheat occupies 17 per cent of cropped area.

4.38 Female buffaloes constitute 21 per cent of livestock population, followed by male cattle (18 per cent), sheep (17 per cent) and female cattle (14 per cent). The livestock pattern is :

Bf₇ S₄ G₄ Cm₄/Cm₁ Cy₁

Rainfall Zone X—C₃ D₁ (D₁ E₃) C₁ D₁ E₂

4.39 The district, taluks and the cropping patterns in the zone are :

| <i>Cropping pattern</i> | <i>Taluk</i> | <i>District</i> |
|----------------------------------------------------------------|--------------|-----------------|
| Pd ₃ M ₃ | Bandipore | Baramulla |
| | Handwara | .. |
| Pd ₃ M ₄ Pu ₄ /W ₄ | Baramulla | .. |
| | Sonawari | .. |
| | Sopore | .. |

4.40 The total area of the zone is 1,370 sq km has an average population density of 384 per sq km.

4.41 The gross cropped area is 95,000 ha, and nearly 43,000 ha is under irrigation. Paddy, Maize and Pulses are the main crops of the zone, occupying 39, 24 and 11 per cent of cropped area respectively.

4.42 Sheep constitute 46 per cent of the total livestock population with female, male and youngstock cattle constituting 17, 16 and 15 per cent respectively. The livestock pattern is :

S₃ Cf₄ Cm₁/Cy₁

Rainfall Zone XI—C₃ D₁ D₃ (E₁ C₁ D₁ E₂)

4.43 The districts, taluks and the cropping patterns are :

| <i>Cropping pattern</i> | <i>Taluk</i> | <i>District</i> |
|--------------------------------------------------------------------------------------------------|--------------|-----------------|
| Pd ₂ M ₄ | Kishtwa | Doda |
| M ₃ W ₄ Ba ₄ /Pu ₄ /Mt ₄ /Pd ₄ | Kulgam | Anantnag |

4.44 The area of the zone is 2,158 sq km and has an average population density of 139 per sq km.

4.45 The gross cropped area is 50,000 ha out of which nearly 24,000 ha is under irrigation. Paddy and maize are the principal crops cultivated occupying 40 and 32 per cent of cropped area respectively.

4.46 Sheep are the principal class of livestock, accounting for 44 per cent of the livestock population. The livestock patterns is S₃ Cf₄ Cm₄/Cy₁.

Rainfall Zone XII—C₃ D₁ (D₄) C₁ D₁ E₂

4.47 The district, taluks and the cropping patterns in the zone are :

| <i>Cropping pattern</i> | <i>Taluk</i> | <i>District</i> |
|--------------------------------|--------------|-----------------|
| M ₁ | Karnah | Baramulla |
| | Uri | .. |
| Pd ₃ M ₃ | Kupwara | .. |
| | Gulmarg | .. |

4.48 The area of the zone is 750 sq km and has a population density of 332 per sq km.

4.49 The gross cropped area is 37,000 ha, out of which 21,000 ha is irrigated. Maize and paddy are the principal crops occupying 46 and 42 per cent of cropped area respectively.

4.50 Sheep constitute 36 per cent of livestock population, followed by female, youngstock and male cattle with 20, 14 and 13 per cent respectively.

Relative Yield Index

4.51 Since RYI values are not available separately for each zone the yield values of important crops are discussed briefly below :

- The RYI of maize for the three year period 1965-68 of the State is 91 per cent of all-India level, though the yield in Punch is higher than all-India and lower in Srinagar.
- The yields of rice are well above all-India level in the northern districts, but less elsewhere.
- The yield of pulses is high in the northern districts being in the range of 150 to 220 per cent of all-India level.

5 FUTURE CROPPING PATTERNS—SOME OBSERVATIONS

General

5.1 In the foregoing sections we have dealt with in detail the rainfall, cropping and livestock patterns which emerge from the existing information. We have also categorised the rainfall patterns into zones and discussed how the other patterns feature in those zones. Among other information that on soils, which ought to play an important role in determining cropping patterns, is lacking in such details as are wanted for this analysis. Data on orography and population density have featured in this analysis but their exact role on cropping and livestock patterns could not be brought out owing to lack of detailed information. We are, however, convinced that studies and analysis indicated in the preceding sections are important for the guidance they may give in deciding cropping and livestock patterns *vis-a-vis* rainfall patterns. The greater the accuracy of the primary information, and the more detailed such information is, the more useful the data would be in drawing up the most efficient cropping and livestock patterns in an area or a zone. With this purpose in view the following procedures are suggested :—

- (i) Delineation of rainfall zones;
- (ii) Identification of the existing cropping patterns;
- (iii) Assessment of area needed for each crop and its ideal distribution.
- (iv) Comparison of (iii) with (ii) in order to determine possible changes; and
- (v) Consideration of other related factors like soil, irrigation facilities, density of population, livestock patterns and then arriving at the future cropping patterns.

5.2 The methods of delineating rainfall patterns or zones and cropping patterns have been fully discussed in Section 2. For the purpose of locating suitable areas for a crop, soil and topography of the land are important factors. The approximate area to be put under each crop will be decided by the demand for it not only at a State level but at the national level, either for internal consumption or for the purpose of export. The departments responsible for crop planning of a State should, therefore, be cognisant of the demand for a crop, so that production efforts are not rendered futile because of lack of demand and marketing. We have already discussed the part each of the factors mentioned in item (v) or para 5.1 is likely to play in deciding cropping patterns. For this purpose not only detailed data but also knowledge about the correlation between these factors and crop performance would be necessary. Knowledge gained, through long experience, by farmers would also be most helpful.

5.3 We ought to mention that the rainfall intervals which form the basis of identifying rainfall patterns

are subject to minor modifications. Thus, the condition that 30 cm of rainfall for three consecutive months is good for paddy may not be rigorously adhered to. If the soil is favourable with a high water retention capacity or, what is more important, water management is efficient with an eye to economise water use, rainfall lower than 30 cm for three months may sustain a good crop of paddy.

5.4 The choice of a cropping pattern is not decided by the farmer only on technical grounds. He is also guided by the profitability of the crops or requirements for his household consumption. Farmers may not be inclined to accept a crop unless the necessary inputs and infrastructure are assured. Of all the inputs water is the most important as is made evident by the spread of groundnut in the country, sugarcane in Gujarat, maize and cotton in Karnataka and recently of wheat in West Bengal. These are excellent instances of the manner of introduction of new crops in the cropping patterns of a State or a region.

Some Observations Pertaining to Jammu & Kashmir

5.5 The district of Punch, Rajauri, Udhampur, Jammu and Kathua experience rainfall of A or B type in the months of July and August. The main crops in these districts are maize and wheat and in low lying situation paddy is also taken here and there. In the districts of Kashmir valley, the main slant is for the production of fruit crops, which require temperate climate. The State has also specialised in the production of vegetable and flower seeds of temperate origin.

5.6 Crop production programmes in the State should be confined to the southern districts and valley areas. Emphasis should increasingly shift towards tapping forest wealth and horticultural development programmes. Just as Kerala is specialising in plantation crops, this State should tend to specialise in fruit crops and forest produce. Such a process would be facilitated if a steady supply of foodgrains could be maintained at reasonable cost. Among fruit crops, special attention might be devoted to the development of exportable varieties of walnuts.

5.7 In the higher elevations of the northern parts, crop production activity is undertaken in the months of March to June after the snow melts. This is the period when irrigation is a problem over the plains. Therefore, the advantage which this State has in the months of March to June could be utilised for bettering the economy of the State by growing off-season vegetable crops wherever it is possible to do so with the snow-melt. The vegetables thus produced could be supplied to other parts of the country. Production of forage materials could be increased considerably in hilly regions which will facilitate development of animal industry specially of sheep and cattle.

APPENDIX I

Talukwise Land Use (1969-70) and Population Statistics

JAMMU AND KASHMIR

Area : '000 hectares

| District/taluk | Population 1971 | | Forests | Nac | Cw | Pp&gl | Mtc &g | Fallow lands | Net area sown |
|------------------|--------------------------|-----------|---------------|------------|------------|--------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|--------------|---------------|
| | total | per sq km | | | | | | | |
| Ladakh | <i>Rainfall Zone—I</i> | | .. | | .. | .. | <i>Rainfall Pattern—E₄(E₄)E₄</i> | | |
| Leh | 51,891 | 134 | — (—) | 23 (60) | 4 (11) | 1 (2) | 1 (2) | 1 (2) | 9 (23) |
| Zaskar | 6,886 | 172 | — (—) | 1 (23) | 1 (33) | neg (0.4) | neg (1) | neg (1) | 2 (42) |
| Kargil | 46,514 | 319 | neg. (0.4) | 5 (32) | 3 (22) | — (—) | 0.2 (1) | neg (0.4) | 6 (44) |
| Jammu | <i>Rainfall Zone—II</i> | | .. | .. | .. | <i>Rainfall Pattern—D₁E₃(B₂ C₁ E₁) D₁E₃</i> | | | |
| Ranbir Singhpora | 156,395 | 389 | — (—) | 0.4 (1) | 5 (13) | — (—) | — (—) | 7 (18) | 28 (68) |
| Rajgauri | <i>Rainfall Zone—III</i> | | .. | .. | .. | <i>Rainfall Pattern—D₂E₂(B₂E₂)D₁E₃</i> | | | |
| Navshera | 72,893 | 65 | 51 (45) | 24 (21) | 13 (12) | 5 (5) | 0.4 (0.4) | 5 (4) | 14 (12) |
| Jammu | <i>Rainfall Zone—IV</i> | | .. | .. | .. | <i>Rainfall Pattern—D₂E₂(A₂C₁E₁) D₁E₃</i> | | | |
| Akhnoot | 122,462 | 112 | 28 (26) | 23 (21) | 13 (12) | 5 (4) | 0.4 (0.4) | 22 (20) | 17 (16) |
| Jammu | 338,219 | 356 | 10 (10) | 30 (32) | 10 (11) | 6 (7) | 2 (2) | 6 (6) | 31 (32) |
| Samba | 114,667 | 137 | 11 (13) | 32 (38) | 12 (14) | 0.3 (0.4) | 1 (1) | 12 (14) | 16 (20) |
| Kathua | <i>Rainfall Zone—V</i> | | .. | .. | .. | <i>Rainfall Pattern—D₄ (D₂E₂) D₁E₃</i> | | | |
| Billawar | 58,071 | 86 | 19 (29) | 20 (30) | 1 (2) | 5 (8) | 6 (9) | 1 (2) | 13 (20) |
| Bashohli | 48,699 | 56 | 36 (42) | 26 (30) | 2 (2) | 3 (4) | 7 (9) | 1 (1) | 10 (12) |
| Kathua | 82,254 | 147 | 8 (15) | 18 (32) | 2 (4) | 1 (2) | 7 (13) | 2 (3) | 19 (33) |
| Hiranagar | 83,647 | 156 | 6 (10) | 14 (26) | 5 (9) | 2 (3) | 2 (4) | 5 (9) | 21 (39) |
| Anantnag | <i>Rainfall Zone—V</i> | | .. | .. | .. | <i>Rainfall Pattern—D₄ (D₂E₂) D₁E₃</i> | | | |
| Anantnag | 274,473 | 477 | 0.1 (0.2) | 10 (18) | 4 (6) | 4 (8) | 2 (3) | 2 (4) | 35 (61) |
| Pulwama | 155,426 | 234 | 0.4 (1) | 11 (16) | 4 (6) | 6 (10) | 1 (1) | 5 (7) | 40 (59) |
| Shupiyan | 98,318 | 316 | 0.3 (1) | 6 (19) | 2 (6) | 3 (10) | 0.3 (1) | 1 (3) | 19 (60) |
| Tral | 60,414 | na | — | — | na | — | — | — | — |
| Pahalgam | 40,692 | 377 | neg (0.3) | 3 (25) | 1 (10) | 1 (9) | 0.1 (1) | 0.3 (2) | 6 (53) |

— = nil or negligible.

n.a. = data not available.

Nac = not available for cultivation

CW = culturable waste

PP & gl = permanent pastures & other grazing lands

Mtc & g = miscellaneous tree crops & groves not included in the net area sown.

NOTE : Figures in brackets represent percentages to total reporting area.

APPENDIX 1 (Contd.)

| District/taluk | Population 1971 | | Forests | Nac | Cw | Pp&gl | Mtc&g | Fallow lands | Net area sown |
|-----------------|------------------------------|-----------|------------|------------|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------|---------------|
| | total | per sq km | | | | | | | |
| | Rainfall Zone—V (concl.), .. | | .. | .. | .. | Rainfall Pattern—D ₄ (D ₂ E ₂) D ₁ E ₃ | | | |
| Srinagar | | | | | | | | | |
| Srinagar | 463,879 | 2035 | 1 (3) | 7 (31) | 2 (8) | 1 (4) | 1 (5) | 0.1 (1) | 11 (48) |
| Beerwah | 78,196 | 357 | 0.2 (1) | 3 (15) | 1 (3) | 2 (10) | 0.1 (1) | 0.3 (1) | 15 (69) |
| Ganderbal | 94,785 | 356 | 1 (2) | 6 (23) | 2 (7) | 2 (7) | 1 (3) | 1 (3) | 15 (55) |
| Chadura | 98,042 | 353 | 0.4 (1) | 3 (11) | 1 (2) | 2 (8) | 0.4 (2) | 1 (3) | 20 (72) |
| Badgam | 92,795 | 330 | 0.2 (1) | 3 (16) | 1 (5) | 3 (9) | 0.2 (1) | neg (0.1) | 19 (69) |
| | Rainfall Zone—VI | | .. | .. | .. | Rainfall Pattern—C ₁ D ₁ E ₂ (A ₂ C ₁ E ₁)C ₁ D ₁ E ₂ | | | |
| Udhampur | | | | | | | | | |
| Reasi | 53,275 | 65 | 37 (45) | 16 (20) | 3 (4) | 2 (3) | 12 (14) | 3 (4) | 8 (10) |
| Udhampur | 121,485 | 112 | 32 (29) | 35 (33) | 9 (8) | 5 (5) | 6 (6) | 2 (2) | 19 (17) |
| Ramnagar | 90,715 | 67 | 70 (51) | 27 (20) | 10 (7) | 6 (5) | 1 (1) | 4 (3) | 18 (13) |
| | Rainfall Zone—VII | | .. | .. | .. | Rainfall Pattern—C ₂ D ₁ E ₁ (A ₂ C ₁ E ₁) C ₁ D ₁ E ₂ | | | |
| Udhampur | | | | | | | | | |
| Goal-Gulabgarh | 73,371 | 67 | 58 (53) | 18 (17) | 3 (2) | 7 (6) | 11 (10) | 1 (1) | 12 (11) |
| Rajauri | | | | | | | | | |
| Rajauri | 116,491 | 114 | 36 (35) | 26 (26) | 5 (5) | 10 (10) | 1 (1) | 1 (1) | 22 (22) |
| Budhal | 27,989 | 75 | 17 (44) | 11 (29) | 1 (3) | 2 (6) | — (—) | 1 (2) | 1 (1) |
| | Rainfall Zone—VIII | | .. | .. | .. | Rainfall Pattern—C ₂ D ₂ (C ₂ D ₂) C ₁ D ₁ E ₂ | | | |
| Doda | | | | | | | | | |
| Doda | 74,139 | 73 | 56 (55) | 12 (12) | 4 (3) | 2 (2) | 14 (14) | 2 (2) | 12 (12) |
| Ramban | 88,783 | 79 | 63 (56) | 21 (18) | 4 (3) | 4 (4) | 7 (6) | 2 (2) | 12 (11) |
| Bhaderwah | 81,455 | 249 | 1 (2) | 13 (39) | 1 (2) | 0.3 (1) | 1 (2) | 5 (15) | 13 (38) |
| | Rainfall Zone—IX | | .. | .. | .. | Rainfall Pattern—C ₂ D ₂ (B ₂ C ₁ E ₁) C ₁ D ₁ E ₂ | | | |
| Punch | | | | | | | | | |
| Haveli | 74,699 | 159 | 9 (18) | 13 (27) | 6 (12) | 7 (16) | 2 (4) | 1 (2) | 10 (21) |
| Mendhar | 96,088 | 144 | 23 (34) | 15 (22) | 2 (2) | 9 (14) | 1 (2) | 3 (5) | 14 (21) |

APPENDIX 1(concl.)

| District /taluk | Population 1971 | | Forests | Nac | Cw | Pp & gl | M/c & g | Fallow lands | Net area sown |
|-------------------|-----------------|-----------|------------------------------------------------------------------------------------------------------------------------------|------------|------------|-----------|---------------|--------------|---------------|
| | total | per sq km | | | | | | | |
| Rainfall Zone —X | | | Rainfall Pattern—C ₃ D ₁ (D ₁ E ₃) C ₁ D ₁ E ₂ | | | | | | |
| Baramula | | | | | | | | | |
| Baramula | 134,007 | 399 | neg (0·1) | 3 (10) | 1 (4) | 3 (8) | 0·1 (0·4) | 2 (5) | 24 (73) |
| Sonawari | 97,244 | 324 | 0·3 (1) | 5 (17) | 2 (5) | 2 (7) | 0·2 (1) | 3 (11) | 17 (58) |
| Bandipore | 71,593 | 447 | neg. (0·2) | 3 (17) | 3 (17) | 1 (7) | 0·1 (1) | 1 (14) | 8 (51) |
| Sapore | 127,823 | 433 | neg (0·3) | 4 (14) | 0·4 (2) | 2 (6) | 0·4 (1) | 1 (2) | 22 (75) |
| Handwara | 96,009 | 344 | 0·3 (1) | 3 (11) | 1 (2) | 2 (8) | 0·1 (1) | 1 (2) | 21 (75) |
| Rainfall Zone—XI | | | Rainfall Pattern—C ₃ D ₁ (D ₃ E ₁)C ₁ D ₁ E ₂ | | | | | | |
| Doda | | | | | | | | | |
| Kishtwar | 97,843 | 60 | 99 (60) | 20 (12) | 9 (7) | 2 (1) | 14 (9) | 1 (1) | 16 (10) |
| Anantnag | | | | | | | | | |
| Kulgam | 202957 | 394 | 0·3 (1) | 9 (17) | 4 (8) | 4 (8) | 1 (1) | 3 (6) | 31 (59) |
| Rainfall Zone—XII | | | Rainfall Pattern—C ₃ D ₁ (D ₄) C ₁ D ₁ E ₂ | | | | | | |
| Baramula | | | | | | | | | |
| Karnah | 22,066 | 272 | 0·1 (1) | 3 (41) | 0·2 (3) | 1 (11) | neg. (0·4) | 1 (11) | 3 (32) |
| Kupwara | 139,749 | 457 | neg. (0·1) | 4 (13) | 3 (8) | 3 (9) | 0·2 (1) | 0·4 (2) | 21 (67) |
| Gulmarg | 37,022 | 343 | neg. (0·4) | 2 (20) | 0·4 (4) | 1 (7) | neg. (0·1) | 0·4 (4) | 7 (64) |
| Uri | 50,211 | 197 | 1 (3) | 8 (32) | 5 (19) | 5 (18) | 0·3 (1) | 1 (2) | 6 (24) |

नमो भगवते वासुदेवाय

APPENDIX 2

Talukwise Livestock Population—1966

JAMMU AND KASHMIR

(Thousands)

| District/ Taluk | Cattle | | | Buffaloes | | | Sheep | Goats | Horses & ponies | Mules | Donkeys | Camels | Pigs | Total live- stock |
|-------------------------|-------------------|------------|----------------|--------------|------------|----------------|------------|------------|-----------------------|------------------------------------------------------------------------------------------------------------------------------|--------------|--------------|--------------|-------------------------|
| | Male | Female | Young stock | Male | Female | Young stock | | | | | | | | |
| Ladakh | Rainfall Zone—I | | | .. | | | .. | | | Rainfall Pattern—E ₄ (E ₄) E ₄ | | | | |
| Leh | 1 (1) | 10 (6) | 6 (3) | | 13* (8) | | 48 (27) | 86 (49) | 5 (3) | 1 (1) | 6 (3) | — (—) | — (—) | 176.8 |
| Zaskar | — (—) | 1 (4) | — (—) | | 3* (16) | | 8 (45) | 5 (29) | 1 (4) | — (—) | 0.2 (1) | — (—) | — (—) | 17.0 |
| Kargil | 1 (1) | 6 (11) | 2 (5) | | 1 (2) | | 22 (45) | 15 (30) | 2 (4) | — (—) | 1 (1) | — (—) | — (—) | 49.2 |
| Jammu | Rainfall Zone—II | | | .. | | | .. | | | Rainfall Pattern—D ₁ E ₃ (B ₂ C ₁ E ₁) D ₁ E ₃ | | | | |
| Ranbir Singh pora | 11 (12) | 19 (21) | 22 (24) | 6 (6) | 17 (19) | 10 (11) | 2 (2) | 2 (2) | 2 (2) | 0.1 (0.1) | 0.3 (0.4) | 0.1 (0.1) | 0.2 (0.2) | 91.5 |
| Rajauri | Rainfall Zone—III | | | .. | | | .. | | | Rainfall Pattern—D ₂ E ₂ (B ₂ E ₂) D ₁ E ₃ | | | | |
| Nowshera | 16 (17) | 17 (18) | 15 (16) | 0.2 (0.3) | 12 (13) | 7 (7) | 7 (7) | 18 (20) | 1 (1) | 0.2 (0.3) | — (—) | — (—) | — (—) | 93.0 |
| Jammu | Rainfall Zone—IV | | | .. | | | .. | | | Rainfall Pattern—D ₂ E ₂ (A ₂ C ₁ E ₁) D ₁ E ₃ | | | | |
| Akhnoor | 23 (26) | 11 (12) | 10 (12) | 2 (2) | 11 (12) | 8 (8) | 3 (3) | 21 (23) | 1 (1) | 0.2 (0.2) | 0.2 (0.2) | 0.4 (0.5) | — (—) | 89.4 |
| Jammu | 24 (15) | 26 (16) | 27 (17) | 4 (2) | 17 (11) | 11 (7) | 9 (5) | 37 (23) | 3 (2) | 0.3 (0.2) | 0.4 (0.3) | 1 (1) | 0.1 (0.1) | 159.3 |
| Samba | 17 (14) | 22 (18) | 23 (19) | 3 (2) | 9 (7) | 7 (5) | 5 (4) | 37 (31) | 1 (1) | 0.1 (0.1) | 0.4 (0.3) | 1 (0.4) | — (—) | 123.5 |
| Kathua | | | | | | | | | | | | | | |
| Billawar | 11 (13) | 14 (16) | 13 (16) | 4 (4) | 7 (8) | 5 (6) | 13 (16) | 17 (20) | 0.4 (0.5) | 0.1 (0.2) | — (—) | — (—) | — (—) | 83.4 |
| Bashohli | 17 (13) | 20 (15) | 21 (16) | 2 (2) | 9 (7) | 7 (5) | 23 (17) | 29 (23) | 1 (1) | 0.2 (0.2) | — (—) | — (—) | — (—) | 129.1 |
| Kathua | | | | | | | | | | | | | | |
| Kathua | 13 (11) | 15 (13) | 18 (16) | 3 (2) | 8 (7) | 6 (5) | 21 (19) | 26 (24) | 2 (2) | 0.3 (0.3) | 1 (1) | 0.2 (0.2) | — (—) | 111.7 |
| Hira- nagar | 12 (13) | 18 (20) | 22 (23) | 4 (5) | 6 (6) | 6 (6) | 8 (9) | 14 (15) | 2 (2) | 0.2 (0.2) | 0.4 (0.5) | 0.3 (0.3) | — (—) | 93.5 |
| Anantnag | Rainfall Zone—V | | | .. | | | .. | | | Rainfall Pattern—D ₄ (D ₂ E ₂) D ₁ E ₃ | | | | |
| Anantnag | 27 (14) | 38 (20) | 32 (17) | — (—) | 2 (1) | 1 (0.3) | 81 (43) | 5 (3) | 5 (2) | 0.2 (0.1) | 0.3 (0.2) | — (—) | — (—) | 189.8 |
| Pulwama | 29 (15) | 29 (15) | 28 (14) | — (—) | 1 (0.4) | 0.1 (0.1) | 91 (48) | 10 (5) | 3 (1) | — (—) | 0.2 (0.1) | — (—) | — (—) | 190.6 |
| Shupiyan | 10 (12) | 13 (15) | 13 (15) | — (—) | 1 (1) | 0.3 (0.3) | 47 (53) | 1 (1) | 2 (2) | 0.1 (0.1) | — (—) | — (—) | — (—) | 88.1 |
| Tral | na | | | | | | | | | | | | | |
| Pahalgam | 5 (16) | 7 (24) | 5 (17) | — (—) | 1 (4) | 0.3 (1) | 10 (32) | 1 (3) | 1 (4) | — (—) | — (—) | — (—) | — (—) | 31.2 |

*In Leh, Kargil and Zaskar taluks total buffaloes are given.

n.a. = data not available

NOTE : Figures in brackets represent percentages to total livestock.

APPENDIX 2 (Contd.)

(Thousands)

| District/ Taluk | Cattle | | | Buffaloes | | | Sheep | Goats | Horses & ponies | Mules | Donkeys | Camels | Pigs | Total live- stock |
|----------------------------------|------------|------------|----------------|--------------|--------------|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----------------------|--------------|--------------|----------|----------|-------------------------|
| | Male | Female | Young stock | Male | Female | Young stock | | | | | | | | |
| Rainfall Zone—V (Contd.) | | | | | | | Rainfall Pattern—D ₄ (D ₂ E ₂) D ₁ E ₃ | | | | | | | |
| Srinagar | | | | | | | | | | | | | | |
| Srinagar | 5 (10) | 18 (34) | 11 (21) | — (—) | 0·1 (0·1) | — (—) | 16 (31) | 1 (3) | 1 (1) | — (—) | 0·1 (0·2) | — (—) | — (—) | 52·0 |
| Beerwah | 8 (14) | 11 (18) | 8 (15) | — (—) | 0·1 (0·1) | — (—) | 27 (46) | 2 (4) | 2 (3) | — (—) | — (—) | — (—) | — (—) | 58·3 |
| Ganderbal | 7 (15) | 10 (20) | 9 (18) | — (—) | 1 (1) | 0·3 (1) | 18 (35) | 3 (6) | 2 (4) | — (—) | — (—) | — (—) | — (—) | 50·3 |
| Chadura | 10 (14) | 11 (16) | 10 (14) | — (—) | 0·3 (0·4) | 0·1 (0·1) | 35 (52) | 1 (2) | 1 (2) | — (—) | — (—) | — (—) | — (—) | 68·4 |
| Badgam | 10 (16) | 13 (21) | 10 (16) | — (—) | 0·1 (0·2) | — (—) | 28 (44) | 1 (1) | 1 (2) | — (—) | — (—) | — (—) | — (—) | 63·0 |
| Rainfall Zone—VI | | | | | | | Rainfall Pattern—C ₁ D ₁ E ₂ (A ₂ C ₁ E ₁) C ₁ D ₁ E ₂ | | | | | | | |
| Udhampur | | | | | | | | | | | | | | |
| Reasi | 15 (12) | 12 (10) | 14 (12) | 1 (1) | 11 (9) | 8 (7) | 20 (17) | 34 (29) | 2 (2) | 1 (1) | — (—) | — (—) | — (—) | 117·4 |
| Udhampur | 28 (16) | 27 (15) | 27 (15) | 3 (2) | 16 (9) | 10 (6) | 27 (16) | 35 (20) | 1 (0·4) | 0·2 (0·1) | — (—) | — (—) | — (—) | 173·8 |
| Ramnagar | 25 (13) | 27 (15) | 25 (13) | 4 (2) | 16 (8) | 11 (6) | 38 (20) | 42 (22) | 1 (0·4) | 0·2 (0·1) | — (—) | — (—) | — (—) | 189·6 |
| Rainfall Zone—VII | | | | | | | Rainfall Pattern—C ₂ D ₁ E ₁ (A ₂ C ₁ E ₁) C ₁ D ₁ E ₂ | | | | | | | |
| Udhampur | | | | | | | | | | | | | | |
| Goal Gulab Garh | 14 (11) | 17 (14) | 15 (12) | 0·3 (0·3) | 13 (11) | 7 (6) | 31 (25) | 23 (19) | 3 (2) | 0·3 (0·3) | — (—) | — (—) | — (—) | 125·5 |
| Rajauri | | | | | | | | | | | | | | |
| Rajauri | na | | | | | | | na | | | | | | |
| Budhal | na | | | | | | | na | | | | | | |
| Rainfall Zone—VIII | | | | | | | Rainfall Pattern—C ₂ D ₂ (C ₂ D ₂) C ₁ D ₁ E ₂ | | | | | | | |
| Doda | | | | | | | | | | | | | | |
| Doda | 21 (17) | 21 (17) | 17 (14) | 0·1 (0·1) | 3 (3) | 1 (1) | 41 (33) | 16 (13) | 1 (1) | — (—) | — (—) | — (—) | — (—) | 122·8 |
| Ramban | 18 (16) | 26 (24) | 17 (15) | 0·1 (0·1) | 6 (6) | 2 (2) | 26 (24) | 13 (12) | 1 (1) | — (—) | — (—) | — (—) | — (—) | 109·2 |
| Bhaderwah | 18 (18) | 18 (17) | 12 (12) | 0·2 (0·2) | 4 (4) | 2 (2) | 35 (34) | 13 (12) | 1 (1) | 0·1 (0·1) | 0·1 (0·1) | — (—) | — (—) | 103·5 |
| Rainfall Zone—IX | | | | | | | Rainfall Pattern—C ₂ D ₂ (B ₂ C ₁ E ₁) C ₁ D ₁ E ₂ | | | | | | | |
| Punch | | | | | | | | | | | | | | |
| Haveli | 10 (16) | 11 (17) | 9 (14) | 0·1 (0·1) | 10 (16) | 4 (7) | 11 (17) | 7 (11) | 1 (1) | 0·1 (0·1) | — (—) | — (—) | — (—) | 63·5 |
| Mendhar | 14 (21) | 7 (10) | 5 (7) | 0·2 (0·3) | 18 (27) | 7 (10) | 11 (16) | 5 (8) | 1 (1) | 0·1 (0·2) | — (—) | — (—) | — (—) | 67·9 |

APPENDIX 2 (Concl'd.)

(Thousands)

| District/ Taluk | Cattle | | | Buffaloes | | | Sheep | Goats | Horses and ponies | Mules | Donkeys | Camels | Pigs | Total live- stock |
|--------------------|------------|------------|----------------|--------------|--------------|----------------|------------|------------|-------------------------|--------------|--------------|------------------------------------------------------------------------------------------------------------------------------|----------|-------------------------|
| | Male | Female | Young stock | Male | Female | Young stock | | | | | | | | |
| Rainfall Zone—X | | | .. | | | .. | | | .. | | | Rainfall Pattern—C ₃ D ₁ (D ₁ E ₃) C ₁ D ₁ E ₂ | | |
| Baramula | | | | | | | | | | | | | | |
| Baramula | 12 (14) | 14 (16) | 12 (14) | — (—) | 0·3 (0·4) | 0·1 (0·1) | 43 (49) | 3 (4) | 2 (2) | — (—) | — (—) | — (—) | — (—) | 86·6 |
| Sonawari | 12 (16) | 13 (18) | 12 (15) | — (—) | — (—) | — (—) | 35 (47) | 1 (2) | 1 (2) | — (—) | — (—) | — (—) | — (—) | 74·9 |
| Bandi- pore | 7 (11) | 10 (14) | 8 (12) | — (—) | 1 (2) | 0·3 (0·4) | 33 (49) | 5 (8) | 3 (4) | 0·2 (0·2) | — (—) | — (—) | — (—) | 67·4 |
| Sopore | 13 (18) | 15 (20) | 12 (16) | — (—) | 0·1 (0·1) | — (—) | 30 (41) | 2 (3) | 1 (2) | — (—) | — (—) | — (—) | — (—) | 72·9 |
| Hand- wara | 13 (20) | 11 (17) | 9 (14) | — (—) | 1 (1) | 0·3 (0·4) | 26 (41) | 3 (5) | 1 (2) | — (—) | — (—) | — (—) | — (—) | 63·3 |
| Rainfall Zone—XI | | | .. | | | .. | | | .. | | | Rainfall Pattern—C ₃ D ₁ (D ₃ E ₁) C ₁ D ₁ E ₂ | | |
| Doda | | | | | | | | | | | | | | |
| Kisht- war | 15 (10) | 19 (13) | 15 (10) | 0·3 (0·2) | 7 (5) | 3 (2) | 60 (41) | 23 (15) | 2 (1) | 2 (1) | 3 (2) | — (—) | — (—) | 148·3 |
| Anantnag | | | | | | | | | | | | | | |
| Kulgam | 20 (13) | 26 (18) | 26 (17) | — (—) | 1 (1) | 0·3 (0·2) | 70 (47) | 3 (2) | 3 (2) | — (—) | 0·2 (0·2) | — (—) | — (—) | 149·2 |
| Rainfall Zone—XII | | | .. | | | .. | | | .. | | | Rainfall Pattern—C ₃ D ₁ (D ₄) C ₁ D ₁ E ₂ | | |
| Baramula | | | | | | | | | | | | | | |
| Karnah | 2 (11) | 5 (19) | 4 (16) | — (—) | 1 (4) | 0·3 (1) | 7 (27) | 4 (18) | 1 (3) | 0·1 (1) | — (—) | — (—) | — (—) | 23·7 |
| Kupwara | 14 (17) | 17 (20) | 10 (12) | — (—) | 1 (1) | 0·2 (0·2) | 32 (39) | 7 (9) | 2 (2) | 0·1 (0·1) | — (—) | — (—) | — (—) | 82·9 |
| Gulmarg | 4 (14) | 4 (17) | 4 (16) | — (—) | 0·2 (1) | 0·1 (0·2) | 11 (44) | 1 (5) | 1 (2) | — (—) | — (—) | — (—) | — (—) | 25·0 |
| Uri | 4 (8) | 10 (20) | 7 (15) | 0·1 (0·1) | 4 (8) | 1 (3) | 14 (30) | 8 (16) | 0·2 (0·4) | — (—) | — (—) | — (—) | — (—) | 47·7 |

APPENDIX 3

Rainfall and Cropping Patterns JAMMU AND KASHMIR

| Cropping patterns | District | Taluk | Area in sq km | Elevation | | Annual total rainfall (cm) | Annual number of rainy days | Month of maximum rainfall | Rainfall in two consecutive months including the month of maximum plus the preceding or succeed- ing month whichever is higher | Consecutive months | | |
|------------------------------------------------------------------------------------------------------------------------------|-----------------|-------|------------------|-----------|-----|-------------------------------------|--------------------------------------|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-----|-----|
| | | | | max | min | | | | | (a) | (b) | (c) |
| | | | | | | | | | | | | |
| Cm no. of rainy days | | | | | | | | | | | | |
| Rainfall Zone—I | | | | | | | | | | | | |
| Mt ₃ W ₄ (W ₄ Pu ₄) | Ladakh | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | Leh | .. | 386 | na | na | 9 | 11 | 8 | 3 | 3 | — | — |
| | Zaskar | .. | 40 | na | na | .. | .. | .. | .. | .. | .. | .. |
| Pd ₃ W ₃ | Kargil | .. | 146 | na | na | 26 | 24 | 3 | 10 | 8 | — | — |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | Rambirsinghpora | .. | 402 | na | na | 91 | 38 | 7 | 50 | 17 | 7—3 | 61 |
| Rainfall Pattern—D ₁ E ₃ (B ₂ C ₁ E ₁) D ₃ E ₃ | | | | | | | | | | | | |
| Rainfall Zone—II | | | | | | | | | | | | |
| Jammu | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Rainfall Zone—III | | | | | | | | | | | | |
| Rajauri | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Rainfall Pattern—D ₂ E ₂ (B ₂ E ₂) D ₁ E ₃ | | | | | | | | | | | | |
| Rainfall Zone—IV | | | | | | | | | | | | |
| Jammu | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| W ₃ M ₄ Pd ₄ /B ₄ | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Pd ₃ M ₄ W ₄ /O ₄ /V ₄ | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| M ₃ W ₄ Ba ₄ /Pu ₄ /Mt ₄ /Pd ₄ | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| W ₃ M ₄ Pd ₄ /B ₄ | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Rainfall Pattern—D ₂ E ₂ (A ₂ C ₁ E ₁) D ₁ E ₃ | | | | | | | | | | | | |
| Rainfall Zone—V | | | | | | | | | | | | |
| Anantnag | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Pd ₃ M ₄ | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Pd ₃ M ₄ W ₄ /O ₄ /V ₄ | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Pd ₃ M ₄ W ₄ /O ₄ /V ₄ | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Pd ₃ M ₄ | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Pd ₃ M ₄ W ₄ /O ₄ /V ₄ | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Pd ₃ M ₄ | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Pd ₃ M ₄ W ₄ /O ₄ /V ₄ | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Pd ₃ M ₄ | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Pd ₃ M ₄ W ₄ /O ₄ /V ₄ | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Pd ₃ M ₄ | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Pd ₃ M ₄ W ₄ /O ₄ /V ₄ | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Pd ₃ M ₄ | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Pd ₃ M ₄ W ₄ /O ₄ /V ₄ | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Pd ₃ M ₄ | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Pd ₃ M ₄ W ₄ /O ₄ /V ₄ | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Pd ₃ M ₄ | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Pd ₃ M ₄ W ₄ /O ₄ /V ₄ | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Pd ₃ M ₄ | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Pd ₃ M ₄ W ₄ /O ₄ /V ₄ | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Pd ₃ M ₄ | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Pd ₃ M ₄ W ₄ /O ₄ /V ₄ | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Pd ₃ M ₄ | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Pd ₃ M ₄ W ₄ /O ₄ /V ₄ | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Pd ₃ M ₄ | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Pd ₃ M ₄ W ₄ /O ₄ /V ₄ | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Pd ₃ M ₄ | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Pd ₃ M ₄ W ₄ /O ₄ /V ₄ | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Pd ₃ M ₄ | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Pd ₃ M ₄ W ₄ /O ₄ /V ₄ | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Pd ₃ M ₄ | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Pd ₃ M ₄ W ₄ /O ₄ /V ₄ | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Pd ₃ M ₄ | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Pd ₃ M ₄ W ₄ /O ₄ /V ₄ | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Pd ₃ M ₄ | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Pd ₃ M ₄ W ₄ /O ₄ /V ₄ | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Pd ₃ M ₄ | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Pd ₃ M ₄ W ₄ /O ₄ /V ₄ | .. | .. | .. | .. | .. | ..</ | | | | | | |

APPENDIX 4

Area under Principal Crops (1969-70)

JAMMU AND KASHMIR

(Thousand hectares)

| District/taluk | Gross cropped area | Pd | Jk | Jr | B | M | R | W | Ba | Mt | G | T | Pu | S | Gn | O | C | L | F | Misc. |
|-----------------------------------------------------------------------------------------------------------------------------|--------------------|---------|-----------|-----|--------|---------|-----|---------|-------|---------|-----------|-----|---------|-----------|-----|---------|-----------|-----|-----|------------|
| Ladakh | | | | | | | | | | | | | | | | | | | | |
| Rainfall Zone—I | | | | | | | | | | | | | | | | | | | | |
| Leh | 9 | (—) | (—) | (—) | (—) | (—) | (—) | 2 | 1 | 4 | (—) | (—) | 0.4 | (—) | (—) | (—) | (—) | (—) | (—) | 1.6 (16) |
| Zaskar | 2 | (—) | (—) | (—) | (—) | (—) | (—) | 0.2 | (—) | 1 | (—) | (—) | 0.2 | (—) | (—) | (—) | (—) | (—) | (—) | 0.6 (31) |
| Kargil | 7 | (—) | (—) | (—) | (—) | (—) | (—) | 1 | (—) | 4 | (—) | (—) | 0.4 | (—) | (—) | (—) | (—) | (—) | (—) | 1.6 (22.8) |
| Rainfall Pattern—E₄(E₄) E₄ | | | | | | | | | | | | | | | | | | | | |
| Jammu | | | | | | | | | | | | | | | | | | | | |
| Rainfall Zone—II | | | | | | | | | | | | | | | | | | | | |
| Ranbir Singhpora | 54 | 25 (46) | (—) | (—) | 1 (1) | 22 (42) | (—) | 0.3 (1) | (—) | (—) | (—) | (—) | 0.4 (1) | 0.2 (0.3) | (—) | 0.1 (1) | 0.1 (0.1) | (—) | (—) | 3.0 (5.6) |
| Rainfall Pattern—D₁E₃ (B₂ C₁ E₁) D₁ E₃ | | | | | | | | | | | | | | | | | | | | |
| Rajauri | | | | | | | | | | | | | | | | | | | | |
| Rainfall Zone—III | | | | | | | | | | | | | | | | | | | | |
| Nowshehra | 23 | 1 (4) | (—) | (—) | (—) | 9 (40) | (—) | 11 (48) | (—) | (—) | (—) | (—) | 1 (3) | 0.1 (0.4) | (—) | 1 (2) | (—) | (—) | (—) | (—) |
| Rainfall Pattern—D₂E₂(B₂E₂) D₁E₃ | | | | | | | | | | | | | | | | | | | | |
| Jammu | | | | | | | | | | | | | | | | | | | | |
| Rainfall Zone—IV | | | | | | | | | | | | | | | | | | | | |
| Akhnour | 33 | 2 (5) | (—) | (—) | 5 (15) | 4 (11) | (—) | 15 (46) | 1 (2) | (—) | 1 (2) | (—) | 5 (14) | (—) | (—) | (—) | (—) | (—) | (—) | (—) |
| Jammu | 52 | 9 (17) | (—) | (—) | 2 (4) | 7 (14) | (—) | 21 (41) | 1 (2) | 1 (2) | 0.4 (1) | (—) | 2 (3) | 0.3 (1) | (—) | 1 (1) | 0.2 (0.4) | (—) | (—) | 7.1 (13.6) |
| Samba | 29 | 3 (9) | (—) | (—) | 3 (9) | 2 (7) | (—) | 13 (51) | 1 (4) | 1 (2) | 0.4 (1) | (—) | 3 (9) | 0.2 (1) | (—) | 1 (2) | 0.1 (0.3) | (—) | (—) | 1.3 (4.5) |
| Rainfall Pattern—D₂ E₂ (A₂ C₁ E₁) D₁ E₃ | | | | | | | | | | | | | | | | | | | | |
| Kathua | | | | | | | | | | | | | | | | | | | | |
| Billawar | 19 | 6 (32) | (—) | (—) | (—) | 5 (26) | (—) | 5 (26) | 1 (5) | (—) | (—) | (—) | 1 (5) | 0.1 (1) | (—) | 0.4 (2) | (—) | (—) | (—) | 0.5 (2.6) |
| Bashohli | 15 | 3 (19) | (—) | (—) | (—) | 5 (34) | (—) | 4 (26) | 1 (7) | 0.1 (1) | (—) | (—) | 1 (5) | (—) | (—) | 1 (7) | (—) | (—) | (—) | (—) |
| Kathua | 26 | 7 (28) | (—) | (—) | (—) | 4 (14) | (—) | 9 (35) | 1 (2) | (—) | 0.2 (1) | (—) | 1 (6) | 0.1 (1) | (—) | 2 (6) | 0.1 (0.4) | (—) | (—) | 1.6 (6.1) |
| Hiranagar | 27 | 4 (15) | 0.1 (0.2) | (—) | 2 (9) | 2 (9) | (—) | 11 (40) | 1 (2) | (—) | 0.1 (0.3) | (—) | 2 (8) | 0.4 (2) | (—) | 2 (8) | 0.3 (1) | (—) | (—) | 2.1 (7.7) |

| Rainfall Zone—V | | Rainfall Pattern— $D_4(D_2E)_2 D_1 E_2$ | | | | | | | | | | | | | |
|-------------------|------------|-----------------------------------------------------------|---|---|------------|---|------------|------------|------------|---|---|------------|---|---|---------------|
| Anantnag | | | | | | | | | | | | | | | |
| Anantnag | 19 (49) | — | — | — | 11 (29) | — | 1 (1) | — | 1 (2) | — | — | 5 (12) | — | — | 2 (5) |
| Pulwama | 19 (37) | — | — | — | 9 (18) | — | 5 (10) | — | — | — | — | 10 (20) | — | — | 5.0 (9.8) |
| Shupiyan | 10 (53) | — | — | — | 5 (26) | — | 1 (5) | — | 0.2 (1) | — | — | 1 (5) | — | — | 1.4 (7.4) |
| Tral | 6 (47) | — | — | — | 2 (30) | — | — | — | — | — | — | 1 (17) | — | — | — |
| Pahalgam | | | | | | | | | | | | | | | |
| Srinagar | | | | | | | | | | | | | | | |
| Srinagar | 11 (35) | — | — | — | 1 (10) | — | 0.3 (3) | 0.1 (1) | 0.3 (3) | — | — | 0.3 (3) | — | — | 4.7 (42.7) |
| Beerwah | 9 (60) | — | — | — | 3 (20) | — | 1 (6) | — | — | — | — | 0.4 (3) | — | — | 0.6 (4.0) |
| Ganderba | 8 (55) | — | — | — | 4 (28) | — | 0.2 (1) | — | 0.2 (1) | — | — | 0.4 (3) | — | — | 1.3 (8.6) |
| Chadura | 7 (34) | — | — | — | 5 (23) | — | 0.4 (2) | — | — | — | — | 3 (13) | — | — | 4.6 (21.9) |
| Badgam | 10 (53) | — | — | — | 4 (21) | — | 1 (6) | — | — | — | — | 1 (7) | — | — | 2.0 (10.5) |
| Rainfall Zone—VI | | Rainfall Pattern— $a_1 D_1 E_2 (A_2 a_1 E_1) a_1 D_1 E_2$ | | | | | | | | | | | | | |
| Udhampur | | | | | | | | | | | | | | | |
| Reasi | 14 (8) | — | — | — | 6 (40) | — | 5 (37) | 0.2 (1) | 1 (8) | — | — | 0.3 (2) | — | — | 0.4 (2.8) |
| Udhampur | 28 (10) | — | — | — | 12 (45) | — | 8 (27) | 4 (1) | 3 (9) | — | — | 1 (3) | — | — | — |
| Ramnagar | 28 (19) | — | — | — | 11 (37) | — | 9 (31) | 1 (3) | 1 (5) | — | — | 1 (2) | — | — | — |
| Rainfall Zone—VII | | Rainfall Pattern— $C_2 D_1 E_1 (A_2 C_1 E_1) C_1 D_1 E_2$ | | | | | | | | | | | | | |
| Udhampur | | | | | | | | | | | | | | | |
| Gool-Gulab Garh | 12 (7) | — | — | — | 10 (83) | — | 1 (6) | — | — | — | — | 0.3 (2) | — | — | — |
| Rajauri | | | | | | | | | | | | | | | |
| Rajauri | 33 (11) | — | — | — | 18 (55) | — | 10 (31) | — | — | — | — | 0.2 (1) | — | — | 0.6 (1.8) |
| Budhal | 6 (12) | — | — | — | 5 (77) | — | — | — | — | — | — | — | — | — | — |
| Legend | | Legend | | | | | | | | | | | | | |
| Pd = paddy | | M = maize | | | | | | | | | | | | | |
| Jk = jowar kharif | | R = ragi | | | | | | | | | | | | | |
| Jr = jowar rabi | | W = wheat | | | | | | | | | | | | | |
| B = bajra | | Ba = barley | | | | | | | | | | | | | |
| | | Mt = millets | | | | | | | | | | | | | |
| | | G = gram | | | | | | | | | | | | | |
| | | T = tur | | | | | | | | | | | | | |
| | | Pu = other pulses | | | | | | | | | | | | | |
| | | S = sugarcane | | | | | | | | | | | | | |
| | | Gn = groundnut | | | | | | | | | | | | | |
| | | O = Other oilseeds | | | | | | | | | | | | | |
| | | C = cotton | | | | | | | | | | | | | |
| | | L = plantations | | | | | | | | | | | | | |
| | | F = fodder | | | | | | | | | | | | | |
| | | Misc = miscellaneous crops | | | | | | | | | | | | | |
| | | (—) = negligible or below 500 hectares | | | | | | | | | | | | | |

Pd = paddy
 Jk = jowar kharif
 Jr = jowar rabi
 B = bajra

M = maize
 R = ragi
 W = wheat
 Ba = barley
 Mt = millets

G = gram
 T = tur
 Pu = other pulses
 S = sugarcane
 Gn = groundnut

O = Other oilseeds

C = cotton

L = plantations

F = fodder

Misc = miscellaneous crops
 (—) = negligible or below 500 hectares

NOTE : 1. Figures in brackets represent percentages to gross cropped area

2. Figures have been rounded off individually and hence Gross totals may not, in some cases, add upto 100.

(Thousand becares)

APPENDIX 4 (Contd.)

| District/taluk | Gross cropped area | Pd | Jk | Jr | B | M | R | W | Ba | Mt | G | T | Pu | S | Gn | O | C | L | F | Misc. |
|---------------------------|--------------------|-------------|----|----|---|------------|---|---|--------------|----|------------|---|----|------------|----|---|---|---|---|-------|
| Rainfall Zone—VIII | | | | | | | | | | | | | | | | | | | | |
| Doda | 16 | 1 (4) | — | — | — | 8 (51) | — | — | 2 (11) | — | 2 (11) | — | — | 1 (7) | — | — | — | — | — | — |
| Doda | | | | | | | | | | | | | | | | | | | | |
| Ramban | 12 | 1 (8) | — | — | — | 10 (85) | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Bhaderwa | 13 | 1 (8) | — | — | — | 7 (55) | — | — | 1 (9) | — | 1 (8) | — | — | 1 (8) | — | — | — | — | — | — |
| Rainfall Zone—IX | | | | | | | | | | | | | | | | | | | | |
| Punch | 12 | 1 (10) | — | — | — | 8 (70) | — | — | 2 (15) | — | — | — | — | 0.1 (1) | — | — | — | — | — | — |
| Haveli | | | | | | | | | | | | | | | | | | | | |
| Mendhar | 17 | 2 (11) | — | — | — | 12 (68) | — | — | 3 (18) | — | — | — | — | — | — | — | — | — | — | — |
| Rainfall Zone—X | | | | | | | | | | | | | | | | | | | | |
| Baramulla | 25 | 8 (32) | — | — | — | 5 (20) | — | — | 4 (16) | — | — | — | — | 2 (8) | — | — | — | — | — | — |
| Baramulla | | | | | | | | | | | | | | | | | | | | |
| Sonawari | 18 | 7 (42) | — | — | — | 4 (22) | — | — | 0.2 (1) | — | 0.1 (1) | — | — | 4 (20) | — | — | — | — | — | — |
| Bandipore | 8 | 4 (44) | — | — | — | 2 (27) | — | — | — | — | — | — | — | 1 (9) | — | — | — | — | — | — |
| Handwara | 22 | 8 (38) | — | — | — | 9 (42) | — | — | 2 (9) | — | — | — | — | 0.2 (1) | — | — | — | — | — | — |
| Sopore | 22 | 10 (46) | — | — | — | 3 (15) | — | — | 1 (3) | — | 0.4 (2) | — | — | 3 (15) | — | — | — | — | — | — |
| Rainfall Zone—XI | | | | | | | | | | | | | | | | | | | | |
| Doda | 18 | 1 (6) | — | — | — | 6 (33) | — | — | 2 (12) | — | — | — | — | 1 (6) | — | — | — | — | — | — |
| Kishtwar | | | | | | | | | | | | | | | | | | | | |
| Anantnag | 32 | 19 (58) | — | — | — | 10 (30) | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Kulgam. | | | | | | | | | | | | | | | | | | | | |
| Rainfall Zone—XII | | | | | | | | | | | | | | | | | | | | |
| Baramulla | 3 | 0.4 (15) | — | — | — | 2 (85) | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Karnah | | | | | | | | | | | | | | | | | | | | |
| Kupwara | 21 | 10 (46) | — | — | — | 8 (41) | — | — | 0.1 (0.4) | — | 0.4 (2) | — | — | 0.4 (2) | — | — | — | — | — | — |
| Gulmarg | 7 | 4 (53) | — | — | — | 2 (26) | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Uri | 6 | 1 (15) | — | — | — | 5 (78) | — | — | — | — | — | — | — | — | — | — | — | — | — | — |